

**WHAT IS CLAIMED IS:**

1. An isolated and purified nucleic acid molecule comprising the nucleotide sequence set forth in SEQ ID NO: 1.
2. The nucleic acid molecule of claim 1 wherein the nucleic acid molecule is RNA.
3. The nucleic acid molecule of claim 1 wherein the nucleic acid molecule is DNA.
4. An expression vector, wherein said vector comprises a nucleic acid sequence set forth in SEQ ID NO: 1.
5. A recombinant host cell comprising the expression vector of claim 4.
6. A canine Cathepsin S protein, in substantially pure form comprising the amino acid sequence set forth in SEQ ID NO: 2.
7. A mono-specific antibody specifically immunologically reactive with canine Cathepsin S protein.
8. The antibody of claim 7, wherein the antibody blocks protease activity of the canine Cathepsin S protein.
9. A process for expression of canine Cathepsin S protein in a recombinant host cell, comprising:
  - a) transferring the expression vector of claim 4 into suitable host cells;
  - and

- b) culturing the host cells of step (a) under conditions which allow expression of the canine Cathepsin S protein from the expression vector.
- 10. A method of identifying compounds that modulate canine Cathepsin S protein activity, comprising:
  - a) combining a compound suspected of being a modulator of canine Cathepsin S protein activity with canine Cathepsin S protein; and
  - b) measuring an effect of the compound on protease activity of the canine Cathepsin S protein.
- 11. The method of claim 10, wherein the effect of the modulator on the protein is inhibiting or enhancing cysteine protease activity.
- 12. A pharmaceutical composition comprising a compound active in the method of claim 10, wherein said compound is a modulator of canine Cathepsin S protease activity.
- 13. A method of treating a patient in need of such treatment for a condition which is mediated by Cathepsin S, comprising administration of a canine Cathepsin S modulating compound active in the method of claim 10.